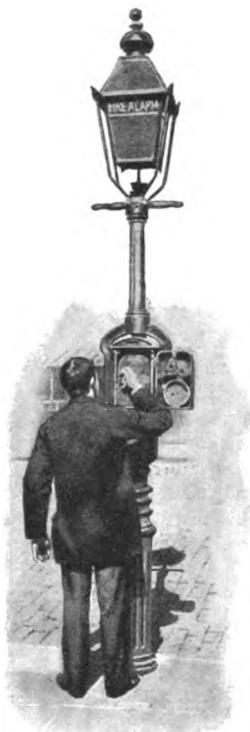


## AN ALARM OF FIRE BY TELEGRAPH.

By C. T. HILL.



A STREET BOX. SENDING IN AN ALARM.

we read the little technical phrase found in the daily ledger kept in every engine-house in New York City.

This book, known as the "house journal," contains a record of all alarms of fire, whether this particular company is called or not.

The movements of the officers and men are also recorded here, the hour and moment of their leaving quarters each day for meals, and an entry made of any event pertaining to the workings of the department.

As we scan this book over, we come to an inscription in red ink, something like this:

6.15 P. M.: Rec'd an alarm by telegraph from Station 448.

In this memorandum 448 is the number of the fire-alarm box from which this alarm was sent—they are known technically as "stations."

"AN alarm of fire by telegraph!"

How much these few words suggest to the mind: The fright, the confusion, the destruction of property, and the possible loss of life. The puffing engines and the shouting men, the crashing of glass and the splashing of water, and, perhaps, finally the smoldering remains of a once comfortable home laid waste by nature's most destructive element—fire.

All this is mentally pictured when

This inscription is unsatisfactory and disappointing.

Turning back a few pages we come to another entry that is more explanatory. It reads something like the following:

10.45 A. M.: Rec'd an alarm of fire by telegraph from Station 357.

Proceeded with company and apparatus and found fire to be at No. 143 West 16th St. Took double hydrant in front of No. 150 W. 16th St., and reported to Chief of 7th Batt.

Was by him ordered to stretch line into basement of house, where a 1½-inch stream was kept 10 minutes.

Company's services being no longer required, was ordered to return to quarters. The following officers and men accompanied apparatus. . . .

Then comes a list of the officers and men going to the fire, and of those who were absent, and a statement of *why* each was absent, for a fireman is held accountable for every moment of time while he is on duty, and his superior officer must know at all times when he is at a fire; and if he is not, the cause of his not being there. The above entry, like the other, is made in red ink, for all records of fires are made in that color, to separate them from the ordinary routine work, which is inscribed in black.

Now, let us trace or follow up this particular alarm of fire and find out *why* it was sent out, and *how* it was conveyed to the firemen, and *how* they received it. This leads us into the mysteries of the "Fire Alarm Telegraph System," without which the science of fire-fighting to-day—no matter how quick the horses, no matter how complete the apparatus, and no matter how eager the men to respond—would be utterly helpless.

We will begin by examining the street boxes, or "stations," as they are called, as it is from them that the alarm is first sent. They are found on almost every other corner in New York City, or, at least, within three or four blocks

of one another. As practically every city or town of any size in the United States has the same sort of boxes, the readers of St. NICHOLAS are probably well acquainted with them, so we will examine only the "keyless box," that is used extensively in New York City.

This box forms part of a lamp-post, the post being so constructed that the box is inserted in the middle. The box is painted a bright red, and the lamp at night shows a red light, thus making it easily discernible either by day or night. The wires from the box are conveyed down through the center of the post to conduits buried in the street, and thence on to fire headquarters.

White letters on a red pane of glass, in the lamp over the box, give directions how to send an alarm,—the same directions in raised letters are found on the face of the box.

If we turn the large brass handle on the outside as far as it will go, a loud gong will ring inside. This is not the alarm, but simply a warning bell to notify the policeman on the beat that the box is being opened and to prevent the sending in of malicious or false alarms of fire, an offense that is punishable in New York State by a fine of \$100 and one year's imprisonment.

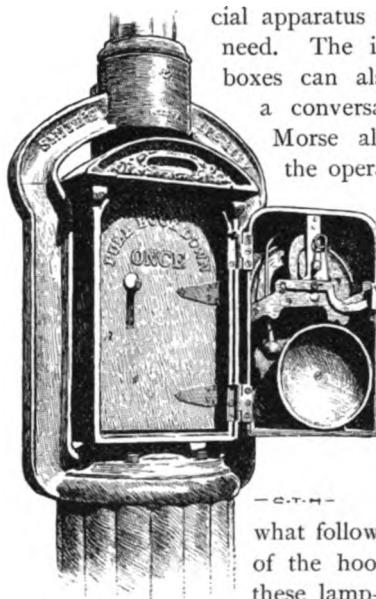
Turning this handle as far as it will go opens the outer door, and we find inside another door, with a slot at the left-hand side, and at the top of this slot a hook projecting. By pulling down this hook *once* and releasing it, we set at work certain clockwork mechanism inside, and this sends in the alarm.

When the first officer arriving at a fire discovers that it is of enough importance to warrant his sending for reinforcements, he opens this inner door and with the "Morse key" sends in a second, third, fourth, fifth, or sixth alarm, as the case may be, or a call for any spe-



KEYLESS BOX, OUTSIDE.

Showing the directions for opening the outer door and for sending an alarm.



KEYLESS BOX, OPENED.

Showing the inner door, and hook

— C. T. H. —  
what follows the pulling of the hook in one of these lamp-post boxes.  
A pan of grease frying on the kitchen range in the basement of a house in West Sixteenth Street boils over and sets fire to the floor. The servants, discovering the kitchen in flames, run screaming from the house. The owner, who happens to be upstairs down, and of fire reflected stairs, dashes est fire-to send in This box happens to be on the corner of Sixteenth Street and Seventh Avenue, halfblock away.

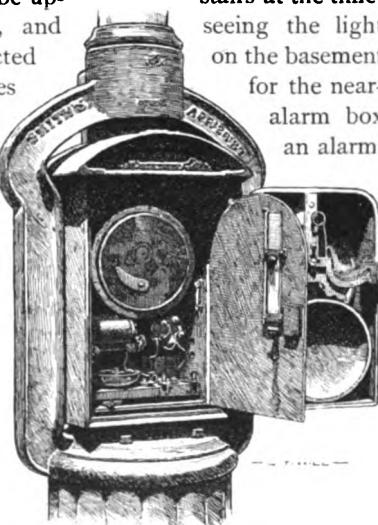
Turning the handle around, he opens the outer door, the warning bell rings, he pulls down the hook on the inside door once, and releasing it, listens. What does he hear? The buzzing of

cial apparatus that he may need. The inspectors of boxes can also carry on a conversation in the Morse alphabet with the operator at headquarters on this key and sounder.

Let us examine the causes that led to the sending in of an alarm from box

— C. T. H. — 357, and also

what follows the pulling of the hook in one of these lamp-post boxes.



KEYLESS BOX, INSIDE.

The inner door opened, showing the cam or lever that operates the clockwork, and the Morse key and sounder for sending telegraph messages to headquarters.

machinery at first, and then "ting, ting, ting!" on a little bell inside. A pause, and "ting, ting, ting, ting, ting!" Another pause, and then "ting, ting, ting, ting, ting, ting, ting!"—357, the number of the box.

This is repeated five times in quick succession, and then the buzzing stops. The alarm has been sent. It may seem like an age to

As he looks up the avenue he sees approaching from Twentieth Street, four blocks to the north, another piece of apparatus—a heavy affair that sways from side to side as it swings from one car-track to another. This is a "truck" or hook-and-ladder company, and it is preceded by a light wagon containing two men, one driving, while the other looks eagerly ahead for the appearance of fire. This is the chief of the 7th Battalion, who afterward has charge of the fire. Whistles and bells in the two adjoining streets to the north of him tell of the approach of more engines. One is coming from the east, the other from the west. The engine approaching from the east turns the corner of Eighteenth Street, two blocks above, just as the one coming from the south is over a



"A FIRE-ENGINE APPEARS, DRAWN BY THREE PLUNGING GRAY HORSES."

the owner as he stands waiting for the firemen to appear, but it is a matter of only a few seconds; for within twenty seconds this station number is ringing in a score or more of engine-houses, and within one minute and a half six companies of apparatus are on their way to this box.

He looks up and down the avenue, and what does he see?

Turning into Seventh Avenue at the intersection of Greenwich Avenue, five blocks to the south of where he stands, a fire-engine appears, drawn by three plunging gray horses. As it straightens out in the broad avenue, they dash madly toward where he stands. A hose-wagon follows, filled with sturdy men donning rubber coats and fire-hats. The bells of both engine and wagon are ringing furiously, and the whistle of the former keeps up a series of short shrieks.

It is truly an inspiring sight, and he almost forgets the destruction that threatens his home.

block away. It is now a mad race between the two to see which will first reach the box. The one approaching from the south has the advantage of a clear run up the avenue, however, and arrives at the corner before the other. The man at the box indicates by pointing to his home the location of the fire, and the driver of this engine, who knows the hydrants in his district as well as he knows the stations, turns the corner on a run and pulls his horses up beside a hydrant nearly opposite the fire.

Another truck company has followed this first appearing engine, also coming from the south. Another battalion chief has turned the corner of Fourteenth Street, coming from the east, and following him a strange-looking apparatus—a four-wheeled wagon, carrying what one might almost call an enormous cannon with an inverted muzzle—this is a "water-tower." Still another detachment dashes toward the box from the north. This is a big red wagon drawn by two noble animals that

are covering the ground with great leaps. It is filled with men wearing white rubber coats and red fire hats. This is a section of the fire-insurance patrol, and they come to protect property from damage by water, and to save what they can. The third engine coming from the west, follows and pulls up at a hydrant on the corner, and "awaits orders."

The first company to arrive have rushed into the basement with their hose. The engine is at work in an instant, and a few dashes of water extinguish the fire. The fire-insurance patrolmen go through the building, opening windows to let the smoke escape, and ascertain the amount of damage done. Members of the first truck company to arrive assist the men from the engine company in putting out any remaining traces of fire, by pulling down wood-work, plaster, etc., in the kitchen. The other companies stand ready to get to work until ordered "to quarters" by the battalion chief; and soon there is little evidence of a fire beyond a wet pavement and a badly wrecked kitchen.

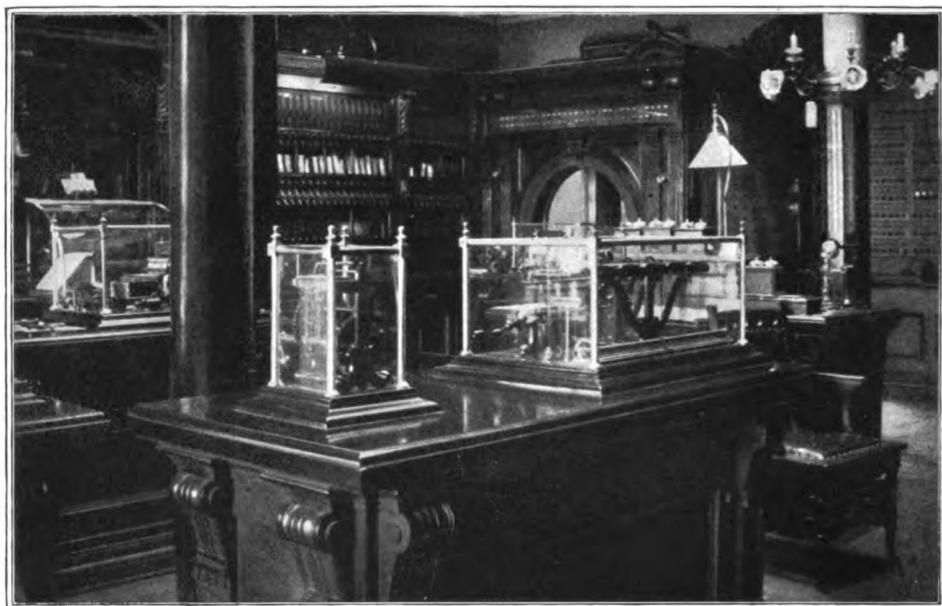


"THE ENGINE APPROACHING FROM THE EAST TURNS THE CORNER."

In reviewing the events that have followed the pulling of the hook in this box, we find that within three minutes from the time the alarm was sent in, an engine and a truck company were on hand. In two minutes more three other companies had arrived, and in exactly seven minutes from the instant the hook was pulled down, three engine companies, two hook-and-ladder companies, a water-tower, and a section of the fire patrol, with two battalion chiefs, were on the spot, and ready to go to work. In all, about fifty-five men, with ten pieces of apparatus—a small fire department in itself.



A HOOK-AND-LADDER COMPANY.



GENERAL VIEW OF THE FIRE-ALARM TELEGRAPH HEADQUARTERS.

This is not remarkable; for if we consider that there are, on an average, from ten to fifteen alarms of fire a day in New York City, we can realize what an ordinary event this becomes. It is partly due to the efficiency of the fire-alarm telegraph system that this rapid concentration of fire forces is possible. Let us visit fire headquarters in East Sixty-seventh Street, and see how the alarms are received and sent out.

We find the telegraph bureau a large, well-lighted room on the sixth floor of the building. In the middle of this room is a raised platform, perhaps a foot in height; and this platform is surrounded on three sides by cabinet-work, almost like immense bookcases, and reaching nearly to the ceiling. A passageway on both sides of this cabinet-work makes the back easily accessible; and an entrance through the middle leads to the battery-room in the rear of the bureau. There is a post in the center of this passageway studded with "push-buttons," and within this three-sided inclosure are the various delicate and intricate machines for receiving and recording the alarms, most of the instruments being protected from injury or dust by cases of glass.

The face of the cabinet-work on both sides is filled with keys, sounders, switches, and all

manner of electrical devices for receiving and transmitting alarms of fire, and all the private telegraph signals used in the work of the fire department.

An operator comes forward, and under his guidance we will look into the methods of attending to a most important branch of the fire service—that of receiving and recording an alarm of fire from a street box, and transmitting the same to the engine companies nearest to the fire, in the shortest possible time. We are first to see the "register," or machine that records the alarm as it comes in from the street box. This machine not only indicates the pulling of a fire-alarm box by clicking off the number of the station, but prints it upon an endless tape of paper about a foot wide.

We find a station recorded thus:

— — — — —  
    1          4          7      — — — — — Station 147.

If we examine this machine closely we shall find five oblong vulcanite (or hard-rubber) cases back of that part that does the printing. Each of these little cases contains ten sounders, and each sounder represents a circuit. There are from ten to fifty boxes on each circuit, so that this machine records the alarms from over

a thousand boxes! A delicate steel rod connects each sounder with a little brass elbow-joint that does the printing, somewhat like the key of a type-writing machine. As each click or pulsation of electricity comes through a sounder, this little rod is pulled back. It depresses the elbow-joint, and this prints a dash upon the paper. There are fifty of these little elbow-joints all in a line, one for each circuit, so that boxes on different circuits print upon different parts of the paper.

We can better understand a "circuit" if we imagine a long wire reaching, say, to the Battery — five miles away — and returning to headquarters. Branch wires running from this main line connect with boxes at different places along the way. No two adjacent boxes are put on the same circuit. Thus we find a circuit connected with a box at Fifty-eighth Street and Broadway, and the next box on the same line is at Forty-sixth Street and Eighth Avenue, twelve blocks away. This is to prevent the possibility of two boxes on the same circuit, or wire, being pulled at once for the same fire.

This delicate and ingenious instrument prevents the possibility of confusion of this kind occurring, for even if two stations were to "click" off at the same time, although it might not be possible to count the clicks, the numbers of the boxes, being on different circuits, will be found printed clear and distinct on different parts of the paper. The operator, divining that both have been pulled for the same fire, sends out only one on the combination key.

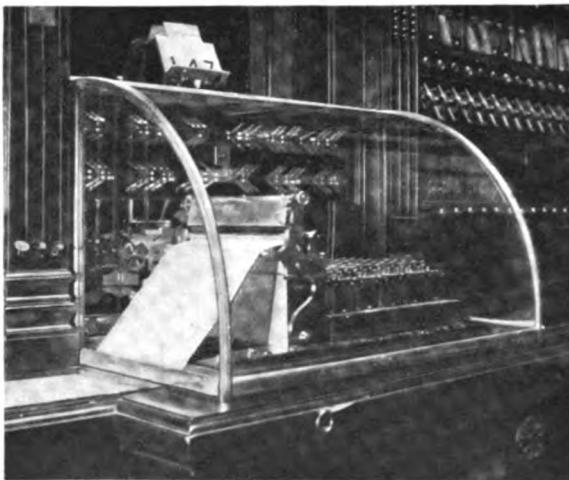
In every engine-house there is a small bell that begins to ring off the alarm as it comes in. This is called the "combination," because it not only tells the number of the box, but it allows a weight to fall that springs a "trip," or lever, that in turn releases the horses. Shortly after this begins, a very large gong rings out in loud strokes. Should the firemen fail to count the strokes of the small bell, they cannot fail to count those of the big gong.

We will now go back to the telegraph bureau and see how these strokes are sent to the engine-houses. We will first look at another instrument or two before we imagine an alarm

to come in, that we may better understand what is being done.

All along the side where the register stands are a number of telegraph keys, one for every circuit — sixty in all, there being ten extra circuits, besides those connected with the register. They are similar to the keys in every telegraph office. In the corner, on the same side, there are eight extra keys. These operate the "combination circuits," the engine-houses being on circuits just as the boxes are. With these the operator rings the combination bell that I have just described. Above each there is a large push-button not unlike a stop in an organ. A number is on the face of each, and they represent the circuits controlled by the keys. A large hand-lever is also here, which throws on an extra-heavy current of electricity whenever it is necessary to use these circuits, a light current only being kept on them at all other times.

Toward the front of the platform, and near the right-hand side of the inclosure, stands another machine, a most important one. It stands upon a cabinet or pedestal of its own, and this machine, called "the repeater," controls the ringing of the big gongs in the engine-houses.



THE REGISTER.

It is carefully inclosed in a glass-case on all sides except that facing the register. Here there is a small round opening near the bottom, through which projects the shaft of one of the larger wheels of the machine. A brass

disk, or "button," is pushed on this shaft when an alarm is being sent out, and controls the number of strokes that this instrument rings upon the big gongs.

In the center of the platform, and directly at the front, stands another machine that is really a wonderful piece of mechanism, a tall, upright instrument, also inclosed in a glass-case. There are four disks or circles to be seen on the front of it, three in a row and one direct-



**A SET OF WHEELS FROM THE SPECIAL** figures can be made. For example, by moving the first three wheels around until 2 shows on the fourth or last; the second wheel around until 3 shows on the third, and the first around until 4 shows on the second wheel, we get 234, the wheels moving from left to right, and the last, or bottom, wheel showing the first number. Beside the upper or top circle, there is a pointer resting upon a dial numbered from 1 to 5. This pointer controls the number of rounds sent out by this machine. By setting it at figure 2 upon the dial, and pressing it down, after we have set the combination of numbers, this instrument will send out two rounds of "234" to all the engine-houses.

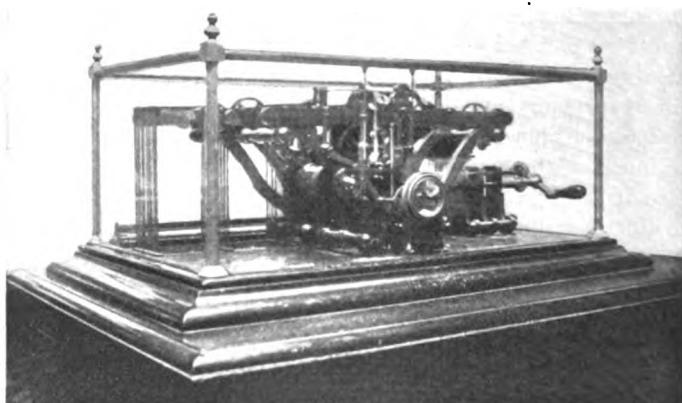
This instrument is called the "special," and is used for sending out the second, third, fourth, fifth, and sixth alarms, and all the special calls used in the service, and can be used for transmitting all regular alarms in case the other instrument breaks down. It is connected by the "big gong" circuit with all the companies in the department, and any combination of strokes on the large gongs can be rung with this instrument. It is entirely automatic, and, after the numbers are properly set on the wheels, never makes any mistakes,

and is really the most important and ingenious machine in the bureau.

Having thus seen all the principal instruments, and understanding their uses, we will now see what happens when an alarm comes in.

An operator sits at a desk in the middle of the platform, answering and attending to the telephone calls coming from the different engine-houses, for this desk is the "central office" of the department. Another operator moves about in front of the "switchboard" on the other side of the platform, testing the strength of currents on the different circuits, etc. There are always two operators on duty, sometimes three, night and day. They work in shifts, or "tours," as they are called, of eight hours each, three tours making up the day.

Suddenly there comes a buzzing of machinery in the direction of the register, followed by a loud "click"—a pause and four more clicks—another pause and seven more clicks,—147, the station I have already mentioned.



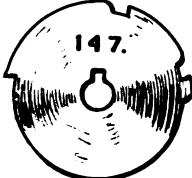
THE REPEATER.

This is repeated five times, the number of rounds the box sends in, but before the first round has clicked off, the operator at the desk has stepped quickly to the register, and glances at the tape. He turns as quickly from this to a cabinet in the center of the platform and at the back of the telephone desk, and opens a drawer. This cabinet is made up of wide, shallow drawers, and as he opens this one we see that it is full of rows of little brass disks about two inches in diameter and a quarter of an inch

thick, each resting over a wooden peg that is fastened to the bottom of the drawer. These are the disks, or "buttons," that operate the repeater, or big-gong instrument.

There is one for every station, or box, each one cut differently; and as there are ten or eleven hundred boxes, it can be seen how many there must be.

A REPEATER BUTTON.



He takes out the one bearing the number of the station that has just come in—147—and passes it to the other operator, who by this time stands beside the repeater. With this disk there are two others, made of cardboard, also bearing the number of the station and having beneath two rows of figures. These figures are the numbers of the circuits or wires over which this alarm has *not* to be sent. He passes one to the operator beside the repeater, and, retaining the other, he steps quickly over to the "combination keys," and pushing down the lever that throws on an extra-heavy current of electricity, with a firm, quick touch he sends in the alarm to the companies nearest the fire.

When he has sent in two rounds, or the number of the box twice, his fellow operator at the repeater pushes the little brass disk that he holds in his hand on the shaft that projects through the round opening in the glass case of the latter instrument, and pressing a push-button, it begins to revolve. As we watch it revolving we see the first little projection on the rim of the disk press against a steel spring beside the shaft, long enough to let one pulsation of electricity pass through the machine. This allows some small cylinders at the top to revolve once. This means one stroke on the big gongs in the engine-houses. When the second projection reaches this spring it keeps it back long enough for four revolutions of the cylinders,—that means four strokes on the big gongs,—and the last and largest projection allows the cylinders to revolve seven times, meaning seven strokes, thus completing the number.

This button, or disk, revolves twice, sending out two rounds of the signal. In the meantime, the other operator has sent out two more rounds on the combination key, so that the

firemen responding to this box receive the number of the station six different times and on two instruments, leaving little chance for mistakes.

In sending out an alarm in this manner, everything is done very quickly—more quickly than it can be described. Not a word is spoken. Conversation of any kind might cause a mistake that would result in the possible loss of valuable property and many lives. Each operator knows exactly what he has to do, and does it silently and quickly.

Even in the case of a large fire, when one alarm follows the other in the most rapid manner, there is little confusion, if any at all. A visitor to the bureau would scarcely realize that an alarm had been received and sent out until it was all over, so systematically is everything done.

When the operator at the combination has finished his task, he turns to a large book beside him, and ascertains the numbers of the com-



THE "SPECIAL."

panies who respond to that box. This book is called the "assignment book," and is issued for the benefit of the different companies of the department; for it tells the number of each box, and its location, and the companies that

are "assigned" or expected to respond to that particular box, on the first, second, third, fourth, fifth, and sixth alarms; also the order in which they are supposed to arrive. Having found the numbers of the companies "due" upon this station, the operator turns to the post in the middle of the platform, and under the row of push-buttons headed "out" he pushes in the numbers of Engine Companies 31, 55, and 12, and Hook-and-Ladder Companies 6 and 8, and Water Tower No. 1, thus putting them "out of service." This means that they have left their respective quarters, and cannot be depended upon to respond to any other alarms that might come in from their district. As he pushes in these buttons, little round disks bearing a similar number drop down in an annunciator at the top of the cabinet-work over the switchboard.

By referring to this annunciator the operator can tell at any time just what companies are "out of service," and should other alarms come in from their neighborhood while they are "out of quarters," he will have other companies respond. When the companies return from

a fire the Morse instruments announce their return by a series of little clicks. This is the captain or officer in charge sending in his "return taps," or "three-fours," as they are known technically, that is, 4-4-4 and the number of the company, thus informing the bureau that his company is back in quarters once more, and ready to respond to other alarms. The opera-

tor replies, "2-3," meaning "all right," on the Morse key, and then, turning to the push-button post, under the heading "in," pushes them back "in service" again. Shortly afterward the officer in charge of the fire calls the operator up on the telephone, and tells him the location of the fire and amount of damage to building and stock or furniture. This account is afterward entered in a "journal" kept in the bureau, and three copies are sent down to the commissioners' rooms, where records are kept of all fires, no matter how slight.

This finishes the routine work in this bureau of receiving and transmitting "an alarm of fire by telegraph." The operation is gone through ten or fifteen times a day—some days less, others many more. In the dead of night, in the early hours of the morning, while we are sleeping, eating, at work or at play, the operator is always here, wide awake, and ever on the alert—ready to answer the call for help that may come from the "little red box," and to send it on to those who will aid us in saving our homes from destruction and ruin.

After this, when we see a fire company responding to the call of duty, we shall better appreciate the methods that have been used to send them on their noble errand. And when we glance through the pages of a metropolitan engine company's "house-journal," we shall better understand how much meaning is hidden beneath that little phrase—"an alarm of fire by telegraph."



THE OPERATOR SENDING OUT AN ALARM ON THE  
"COMBINATION."